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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,284	12/03/2003	J. Scott Price	GEMS 0136 PUS	1283
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ARTZ & ARTZ, P.C. 28333 TELEGRAPH RD. SUITE 250 SOUTHFIELD, MI 48034			KAO, CHIH CHENG G	
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Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/707,284	<b>Applicant(s)</b> PRICE ET AL.	
	<b>Examiner</b> Chih-Cheng Glen Kao	<b>Art Unit</b> 2882	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 October 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-10 and 12-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-10 and 12-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 2, 4, 7, 9, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernacki (US 4119855) in view of Meyer et al. (US 6002202) and Barrett (US 6674838).

2. Regarding claims 1 and 17, Bernacki discloses an apparatus and method comprising a source housing (fig. 2, #54) comprising a source window (fig. 2, #58) forming a structure, that separates a source interior (fig. 2, #48) from an external low-pressure cavity (fig. 2, #64), with said source housing and necessarily having a first voltage potential (fig. 2, #58), a source electrode (fig. 2, #50) necessarily having a second voltage potential and generating electrons (fig. 2, electron gun), said source electrode emitting said electrons through said source window (fig. 2, #58) to a target (fig. 2, #60) external to said source housing and internal to an imaging tube (fig. 2), and at least partially filling said low-pressure cavity with a low-pressure gas (fig. 2, #67).

However, Bernacki fails to disclose a non-apertured source window forming a sealed structure, and wherein a source window comprises feedthroughs for a coolant to flow therein and absorb heat from a source window.

Meyer et al. teaches a non-apertured source window forming a sealed structure (title and col. 1, lines 12-15). Barrett teaches wherein a source window (fig. 1, #58) comprises feedthroughs (fig. 1, #68) for a coolant (col. 9, line 23) to flow therein and absorb heat from said source window (fig. 1, #58).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus and method of Bernacki with the non-apertured window of Meyer et al., since one would be motivated to make such a modification for better isolating different environments (col. 12, lines 16-26) as shown by Meyer et al.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus and method of Bernacki with the feedthroughs of Barrett, since one would be motivated to make such a modification to better cool at specific locations compared to indirect cooling systems (col. 3, lines 62-66) for reducing thermal damage and to strengthen x-ray intensity as implied from Barrett.

3. Regarding claims 2 and 19, Bernacki as modified above suggests an apparatus and method as recited above.

However, Bernacki fails to disclose a coolant channel housing thermally coupled to and at least partially defined by a source housing comprising a coolant channel and a coolant flowing therein, said coolant absorbing heat from the source housing.

Barrett further teaches a coolant channel housing (fig. 1, #68) thermally coupled (fig. 1, #64) to and at least partially defined by a source housing (fig. 1, #66) comprising a coolant

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channel (fig. 1, #68) and a coolant flowing (col. 9, line 23) therein, said coolant absorbing heat from the source housing (fig. 1, #64 and 68).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus and method of Bernacki with the feedthroughs of Barrett, since one would be motivated to make such a modification to better cool at specific locations compared to indirect cooling systems (col. 3, lines 62-66) for reducing thermal damage and to strengthen x-ray intensity as implied from Barrett.

4. Regarding claims 4 and 18, Bernacki further discloses wherein said source window (fig. 2, #58) allows direct electron emission (fig. 2, from #50) to pass through said source window (fig. 2, #58) to said target (fig. 2, in #60) and prevents indirect electron emission from passing through said source window (fig. 2, #58).

5. Regarding claim 7, Bernacki would necessarily have a variable potential (on and off).

6. Regarding claim 9, Bernacki as modified above suggests an apparatus as recited above.

However, Bernacki fails to disclose an electron beam source as a complete and separate sub-assembly of an imaging tube.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to further incorporate the apparatus of Bernacki as modified above with a separate sub-assembly, since constructing a formerly integral structure in various elements

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involves only routine skill in the art. One would be motivated to make such a modification for cheaper replacement of parts.

7. Regarding claim 20, Bernacki would necessarily utilize said low-pressure gas (fig. 2, #67) to enhance heat transfer between the target (fig. 2, #60) and a frame of the imaging tube (fig. 2, #64).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernacki, Meyer et al., and Barrett as applied to claim 1 above, and further in view of Beland (US Patent 5241260).

Bernacki as modified above suggests an apparatus as recited above.

However, Bernacki fails to disclose a thermionic tungsten wire coil.

Beland teaches a thermionic tungsten wire coil (col. 1, lines 40-41).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Bernacki as modified above with the thermionic tungsten wire coil of Beland, since one would be motivated to make such a modification for greater emission intensity (col. 1, lines 43-46) as implied from Beland, due to tungsten's ability to maintain integrity at high temperatures.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernacki, Meyer et al., and Barrett as applied to claim 1 above, and further in view of Nakamura et al. (US Patent 5517545).

Bernacki as modified above suggests an apparatus as recited above.

However, Bernacki fails to disclose a source electrode as a focusing electrode.

Nakamura et al. teaches a source electrode as a focusing electrode (fig. 5, #15d).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Bernacki as modified above with the focusing electrode of Nakamura et al., since one would be motivated to make such a modification for greater emission intensity (fig. 5) as implied from Nakamura et al.

10. Claims 8 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernacki, Meyer et al., and Barrett as applied to claim 1 above, and further in view of Matsushita et al. (US Patent 6526122).

Bernacki as modified above suggests an apparatus as recited above.

However, Bernacki fails to disclose a grid coupled between a source electrode and a target, said grid focusing electrons, and wherein said grid is coupled within a source housing.

Matsushita et al. teaches a grid (fig. 1, #72) coupled between a source electrode (fig. 1, #73) and a target (fig. 1, #32), said grid focusing electrons (col. 1, lines 18-21), and wherein said grid (fig. 1, #72) is coupled within a source housing (fig. 1, housing of #2).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Bernacki as modified above with the focusing grid of Matsushita et al., since one would be motivated to make such a modification to better obtain predetermined x-rays (col. 1, lines 28-31) as implied from Matsushita et al.

11. Claims 10, 12-16, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernacki, Meyer et al., and Barrett as applied to claim 1 above, and further in view of Yamaguchi (JP 54-151384).

12. Regarding claims 10, 12, 15, 16, and 21, Bernacki as modified above suggests an apparatus as recited above.

However, Bernacki fails to disclose a rotating target having a third voltage potential in a cavity containing said rotating target for a beam source directed at a glancing angle and a window having a voltage potential that is approximately equal to a voltage potential of a target.

Barrett teaches a rotating target (fig. 1, #106) having a third voltage potential in a cavity containing said rotating target for a beam source directed at a glancing angle (fig. 1, #106). Yamaguchi teaches a window (fig. 1, #21) having a voltage potential that is approximately equal to a voltage potential (abstract, constitution) of a target (fig. 1, #17).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Bernacki as modified above with rotating target of Barrett, since one would be motivated to make such a modification for better x-ray emission (fig. 1, from #106) as implied from Barrett.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Bernacki as modified above with the voltage potentials of Yamaguchi, since one would be motivated to make such a modification for reducing discharge for more stable operation (abstract) as implied from Yamaguchi.



13. Regarding claims 13 and 14, Bernacki further discloses a frame (fig. 2, #64) coupled within the imaging tube, a low-pressured cavity (fig. 2, inside #64) fluidically coupled between the frame and a target (fig. 2, #60), said cavity at least partially defined by the frame, target, and electron beam source (fig. 2, #54), and said cavity at least partially exhausted or filled with a low-pressure gas (fig. 2, #67) comprising at least one of a low-Z substance, helium (col. 3, line 14), nitrogen, or argon.

14. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernacki, Meyer et al., Barrett, and Yamaguchi as applied to claim 10 above, and further in view of Koller (US Patent 6438208).

Bernacki as modified above suggests an apparatus as recited above.

However, Bernacki fails to disclose a frame, an x-ray window coupled to said frame, and a coolant channel housing comprising coolant channels coupled to said frame and cooling said x-ray window.

Koller teaches a frame (fig. 1, #104), an x-ray window (fig. 1, #200) coupled to said frame (fig. 1, #104), and a coolant channel housing (fig. 1, #310) comprising coolant channels (fig. 2, #308) coupled to said frame (fig. 1, #104) and cooling said x-ray window (col. 6, lines 15-30).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Bernacki as modified above with the coolant of Koller, since one would be motivated to make such a modification for minimizing thermal stress and strain (col. 2, lines 43-46) as implied from Koller.

15. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernacki, Meyer et al., Barrett, Yamaguchi, and Koller as applied to claim 23 above, and further in view of Richardson (US Patent 6529579).

Bernacki as modified above suggests an apparatus as recited above.

However, Bernacki fails to disclose wherein coolant cooling an x-ray window are fluidically coupled to feedthroughs.

Richardson teaches wherein coolant (fig. 2, #302) cooling an x-ray window (fig. 1, #112) are fluidically coupled to feedthroughs (fig. 2, #506).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Bernacki as modified above with the fluidically coupled coolant of Richardson, since one would be motivated to make such a modification for removing excessive heat more effectively and efficiently (col. 3, lines 35-40) as implied from Richardson.

### ***Response to Arguments***

16. Applicant's arguments with respect to claims 1, 2, 4-10, and 12-24 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



gk



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